

8.7

Circumference and Area of Circles

Goal Find the circumference and area of circles.

VOCABULARY

Circle, center

Radius

Diameter

Circumference

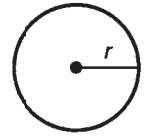
Central angle

Sector

CIRCUMFERENCE OF A CIRCLE

Words The circumference of a circle is the product of ____ and the ____ or twice the product of ____ and the ____.

Symbols $C = \underline{\hspace{1cm}}$ or $C = \underline{\hspace{1cm}}$



Example 1 Find the Circumference of a Circle

Find the circumference of the circle.



Solution

$$C = 2\pi r$$

Formula for circumference

$$= 2\pi(\underline{\hspace{1cm}})$$

Substitute ____ for r .

$$= \underline{\hspace{1cm}}\pi$$

Simplify.

$$\approx \underline{\hspace{1cm}}(\underline{\hspace{1cm}})$$

Use ____ as an approximation for π .

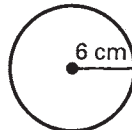
$$= \underline{\hspace{1cm}}$$

Multiply.

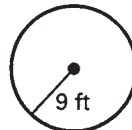
Answer The circumference is about ____ inches.

✓ **Checkpoint** Find the circumference of the circle. Round your answer to the nearest whole number.

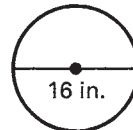
1.



2.



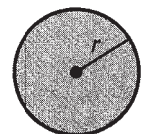
3.



AREA OF A CIRCLE

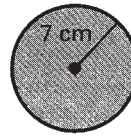
Words The area of a circle is the product of ____ and ____.

Symbols $A = \underline{\hspace{1cm}}$



Example 2 Find the Area of a Circle

Find the area of the circle.

**Solution**

$$A = \pi r^2$$

Formula for area of a circle

$$= \pi(\quad)^2$$

Substitute \quad for r .

$$= (\quad)\pi$$

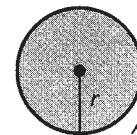
Simplify.

$$\approx \quad$$

Use a calculator.

Answer The area is about \quad square centimeters.**Example 3 Use the Area of a Circle**

Find the radius of a circle with an area of 380 square feet.



$$A = 380 \text{ ft}^2$$

Solution

$$A = \pi r^2$$

Formula for area of a circle

$$\quad = \pi r^2$$

Substitute the \quad for A .

$$\quad \approx r^2$$

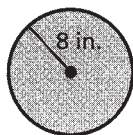
Divide each side by \quad . Use a calculator.

$$\quad \approx r$$

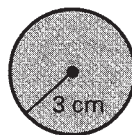
Take the \quad .Answer The radius is about \quad feet.

✓ **Checkpoint** In Exercises 4–6, find the area of the circle. Round your answer to the nearest whole number.

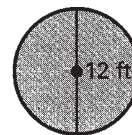
4.



5.



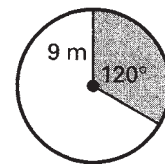
6.



7. Find the radius of a circle with an area of 113 square meters.

Example 4 Find the Area of a Sector

Find the area of the shaded sector.

**Solution**

1. Find the area of the circle.

$$A = \pi r^2 = \pi(\quad)^2 \approx \quad \text{square meters}$$

2. Find the area of the sector. Let
- x
- be the area of the sector.

$$\frac{\text{Area of sector}}{\text{Area of entire circle}} = \frac{\text{Measure of central angle}}{\text{Measure of entire circle}}$$

$$\frac{x}{\quad} = \quad$$

Substitute.

$$(\quad)(x) = (\quad)(\quad)$$

Cross product property

$$\quad x = \quad$$

Simplify.

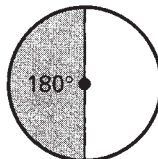
$$x \approx \quad$$

Divide each side by \quad .Answer The area of the sector is about \quad square meters.

- ✓ **Checkpoint** In Exercises 8 and 9, A represents the area of the entire circle and x represents the area of the shaded sector. Complete the proportion used to find the value of x . Do not solve the proportion.

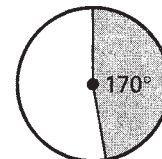
8. $A = 22 \text{ m}^2$

$$\frac{x}{\quad} = \frac{180^\circ}{\quad}$$



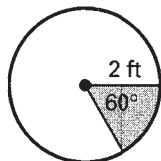
9. $A = 28 \text{ ft}^2$

$$\frac{x}{\quad} = \frac{\quad}{360^\circ}$$

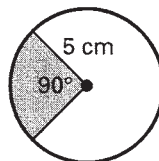


Find the area of the shaded sector. Round your answer to the nearest whole number.

10.



11.



12.

